

**Raw Recommended Conservation Measures Received from Species Specialists
at and Subsequent to Workshops for “m” Goal Plants**

| |
|--|
| Rose mallow (<i>Hibiscus lasiocarpus</i>) |
| 1. Maintain processes that support the dynamic habitat of reose mallow throughout the species range and associated with existing source populations. |
| 2. Research the extent and physical and biological qualities of existing habitat and populations prior to levee or restoration actions. |
| 3. Create unvegetated, exposed substrate at tidal margins of restored and created tidal fresh emergent wetland and riparian habitat. |
| 4. Maintain and restore habitat and populations throughout the species geographic ranges and expand the species ranges to the historical and ecological ranges based on hydrological, salinity and other habitat attributes. |
| 5. For each linear foot of occupied habitat lost, create 5-10 linear feet of suitable habitat, of equal or higher habitat quality, within one year of loss. |
| 6. Monitoring existing populations and their habitat at five year intervals and design and implement a remediation plan if the prescription is not met. |
| 7. Incorporate suitable habitat for this species into levee designs. |
| 8. Incorporate sufficient edge habitat to support the species in levee set back and channel island habitat resoration designs. |
| 9. Maximize sinuosity of restored and created slough channels to increase water-land edge habitat. |
| Ione Formation Plants: Ione buckwheat (<i>Eriogonum apricum</i> var. <i>apricum</i>), Irish Hill buckwheat (<i>Eriogonum apricum</i> var. <i>prostratum</i>), Ione manzanita (<i>Arctostaphylos myrtifolia</i>), and Parry’s horkelia (<i>Horkelia parryi</i>) |
| 1. These plant species are so rare and limited in distribution that impacts to idividual plants or occupied habitat should be avoided. |
| 2. Develop a conservation plan and protect extant populations of Ione plantsand their habitat throughout their geographic and ecological range. |
| 3. Research the ecology of the four species and develop appropriate management prescriptions. |
| 4. Monitor all protected sites over time, expecially following management activities, and modify management using adaptive management. |
| Pine Hill Plants: Stebbins’ morning-glory (<i>Calystegia stebbinsii</i>), Pine Hill ceanothus (<i>Ceanothus roderickii</i>), Pine Hill flanelbush (<i>Fremontodendron californicum</i> ssp. <i>decumbens</i>), El Dorado bedstraw (<i>Galium californicum</i> ssp. <i>sierrae</i>) and Layne’s ragwort (<i>Senecio layneae</i>) |
| 1. These plant species are so rare and limited in distribution that impacts to idividual plants or occupied habitat should be avoided. |
| 2. Implement the existing conservaton plan, developed by Julie Horenstein. Protect suite of species throughout their geographic and ecological range. |

| |
|--|
| 3. Protect sites large enough (greater or equal to 300 acres) to apply appropriate management (including prescribed fire) to maintain the ecosystem. |
| 4. Monitor populations after any management activities and modify future management using adaptive management. |
| Vernal Pool Plants: slender Orcutt grass (<i>Orcuttia tenuis</i>), Hoover's spurge (<i>Chamaesyce hooveri</i>), succulent owl's clover (<i>Castilleja campestris</i> ssp. <i>succulenta</i>), Boggs Lake hedge-hyssop (<i>Gratiola heterosepala</i>), Greene's legumere (<i>Legenere limosa</i>) and spiny-sepaled button-celery (<i>Eryngium spinosepalum</i>) |
| 1. Avoid all natural vernal pool occupied habitat. |
| 2. Removed occupied low quality, non-natural habitat must be mitigated by preservation of natural habitat at a ratio of 3 acres of preserved habitat per acre of removed habitat and restoration of 1 acre of restored habitat per acre of removed habitat. |
| 3. Areas preserved and restored for mitigation must be located within a 40 mile radius on the same geomorphic surface as impacted populations. |
| Marsh skullcap (<i>Scutellaria galericulata</i>) |
| 1. Avoid all high quality occupied habitat. |
| 2. Removed occupied low quality habitat must be mitigated by preservation of natural habitat at a ratio of 3 acres of preserved habitat per acre of removed habitat and restoration of 1 acre of restored habitat per acre of removed habitat. |
| 3. Areas preserved and restored for mitigation must be located within a 40 mile radius on the same geomorphic surface as impacted populations. |
| San Joaquin woollythreads (<i>Lembertia congdonii</i>) |
| 1. Avoid impacts on high quality natural habitat occurrences. |
| 2. For each acre of occupied habitat lost, preserve (preferably by acquisition) 6 acres of high quality occupied habitat and for each acre of unoccupied habitat lost preserve one acre of suitable unoccupied habitat. |
| 3. Develop a seed bank from all removed populations and use the collected seed for inoculating unoccupied suitable habitat. |
| Sanford's arrowhead (<i>Sagittaria sanfordii</i>) and four-angled spike-rush (<i>Eleocharis quadrangulata</i>) |
| 1. Avoid impacts on high quality natural habitat occurrences. |
| 2. Enhance and manage (including reduction of competition) existing occupied habitat to increase population size three-fold. |
| 3. For each acre of lost occupied habitat restore or create one acre of potential habitat. |
| 4. Restored and enhanced habitats must be subject to a natural hydrologic regime. |
| big tarplant (<i>Blepharizonia plumosa</i> ssp. <i>plumosa</i>), Lost Hills crownscale (<i>Atriplex vallicola</i>), shaggyhair lupine (<i>Lupinus spectabilis</i>), adobe-lily (<i>Fritillaria pluriflora</i>) |
| 1. Avoid impacts on high quality occurrences in natural habitat. |

| |
|--|
| 2. For each acre of occupied habitat lost, preserve (by acquisition) 6 acres of high quality occupied habitat and preserve for each acre of unoccupied suitable habitat one acre of suitable habitat. |
| 3. Develop seed bank from all removed populations and use for inoculating unoccupied suitable habitat. |
| Marin western flax (<i>Hesperolinon congestum</i>), Napa western flax (<i>Hesperolinon serpentinum</i>), Rawhide Hill onion (<i>Allium tuolumnense</i>), Red Hills soaproot (<i>Chlorogalum grandiflorum</i>), Brandaegae's eriastrum (<i>Eriastrum brandegae</i>), Tehama County western flax (<i>Hesperolinon tehamense</i>), Brewer's western flax (<i>Hesperolinon breweri</i>) |
| 1. Avoid impacts on high quality natural habitat occurrences. |
| 2. For each acre of occupied habitat lost, preserve (by acquisition) 6 acres of high quality occupied habitat and preserve one acre of suitable habitat for each acre of impacted unoccupied suitable habitat. |
| 3. Develop a seed bank from all removed populations and use the collected seed for inoculating unoccupied suitable habitat. |
| 4. Restored, enhanced or preserved habitats must be within 40 mile radius and on the same geomorphic surface as the impacted populations. |
| Hoover's eriastrum (<i>Eriastrum hooveri</i>), El Dorado County mule ears (<i>Wyethia reticulata</i>), most beautiful jewel-flower (<i>Streptanthus albidus</i> ssp. <i>peramoenus</i>), recurved larkspur (<i>Delphinium recurvatum</i>) |
| 1. Avoid impacts on high quality occurrences on natural habitat. |
| 2. Enhance and manage (including reduction of competition) existing occupied habitat to increase population size three-fold and restore or create one acre of habitat for each acre of lost occupied habitat. |
| 3. Restored and enhanced habitats must be within 40 mile radius on the same geomorphic surface as the impacted populations. |
| Diablo helianthella (<i>Helianthella castanea</i>), Congdon's tarplant (<i>Hemizonia parryi</i> ssp. <i>congdonii</i>), Brittlescale (<i>Atriplex depressa</i>), San Joaquin spearscale (<i>Atriplex joaquiniana</i>), heartscale (<i>Atriplex cordulata</i>) |
| 1. Avoid impacts on high quality natural habitat occurrences. |
| 2. Enhance and manage (including reduction of competition) existing occupied habitat to increase population size three-fold and restore or create one acre of habitat for each acre of lost occupied habitat. |
| 3. Restored and enhanced habitats must be within 40 mile radius of impacted populations. |

Clara Hunt's milk-vetch (*Astragalus clarianus*), large-flowered fiddleneck (*Amsinkia grandiflora*), red-flowered lotus (*Lotus rubriflorus*), California seablite (*Suaeda californica*), lesser saltscare (*Atriplex minuscule*), Ferris's milk-vetch (*Astragalus tener* var. *ferrisiae*), Sonoma sunshine (*Blennosperma bakeri*), Loch Lomond button-celery (*Eryngium constancei*), Ahart's dwarf rush (*Juncus leiospermus* var. *ahartii*), Contra Costa goldfields (*Lasthenia conjugens*), Butte County meadowfoam (*Limnanthes floccosa* ssp. *californica*), Sebastopol meadowfoam (*Limnanthes vincularis*), few-flowered navarretia (*Navarretia leucocephala* ssp. *pauciflora*), many-flowered navarretia (*Navarretia leucocephala* ssp. *plieantha*), pincushion navarretia (*Navarretia myersii*), Colusa grass (*Neostaphia colusana*), San Joaquin Valley Orcutt grass (*Orcuttia inaequalis*), hairy Orcutt grass (*Orcuttia pilosa*), Sacramento Orcutt grass (*Orcuttia viscida*), North Coast semaphore grass (*Pleuropogon hooverianus*), Green's tucoria (*Tuctoria greenei*), Henderson's bent grass (*Agrostis hendersonii*), Chinese Camp brodiaea (*Brodiaea pallida*), white sedge (*Carex albida*), bristly sedge (*Carex comosa*), Slough thistle (*Cirsium crassicaule*), Pitkin Marsh lily (*Lilium pardalinum* ssp. *pitkinense*), eel-grass pondweed (*Potamogeton zosteriformis*), Kenwood Marsh checkerbloom (*Sidalcea oregana* ssp. *valida*), California beaked-rush (*Rhynchospora californica*), Sonoma alopecurus (*Alopecurus aequalis* var. *sonomensis*), Napa blue grass (*Poa napensis*), mad-dog skullcap (*Scutellaria lateriflora*), Calistoga popcorn-flower (*Plagiobothrys strictus*), Point Reyes bird's-beak (*Cordylanthus maritimus* ssp. *palustris*), hispid bird's-beak (*Cordylanthus mollis* ssp. *hispidus*), Marin knotweed (*Polygonum marinense*), palmate-bracted bird's-beak (*Cordylanthus palmatus*)

These plant species are so rare and limited in distribution that impacts to individual plants or occupied habitat should be avoided.

Marsh checkerbloom (*Sidalcea oregana* ssp. *hydrophila*)

Existing information is insufficient to determine conservation measures for this species.